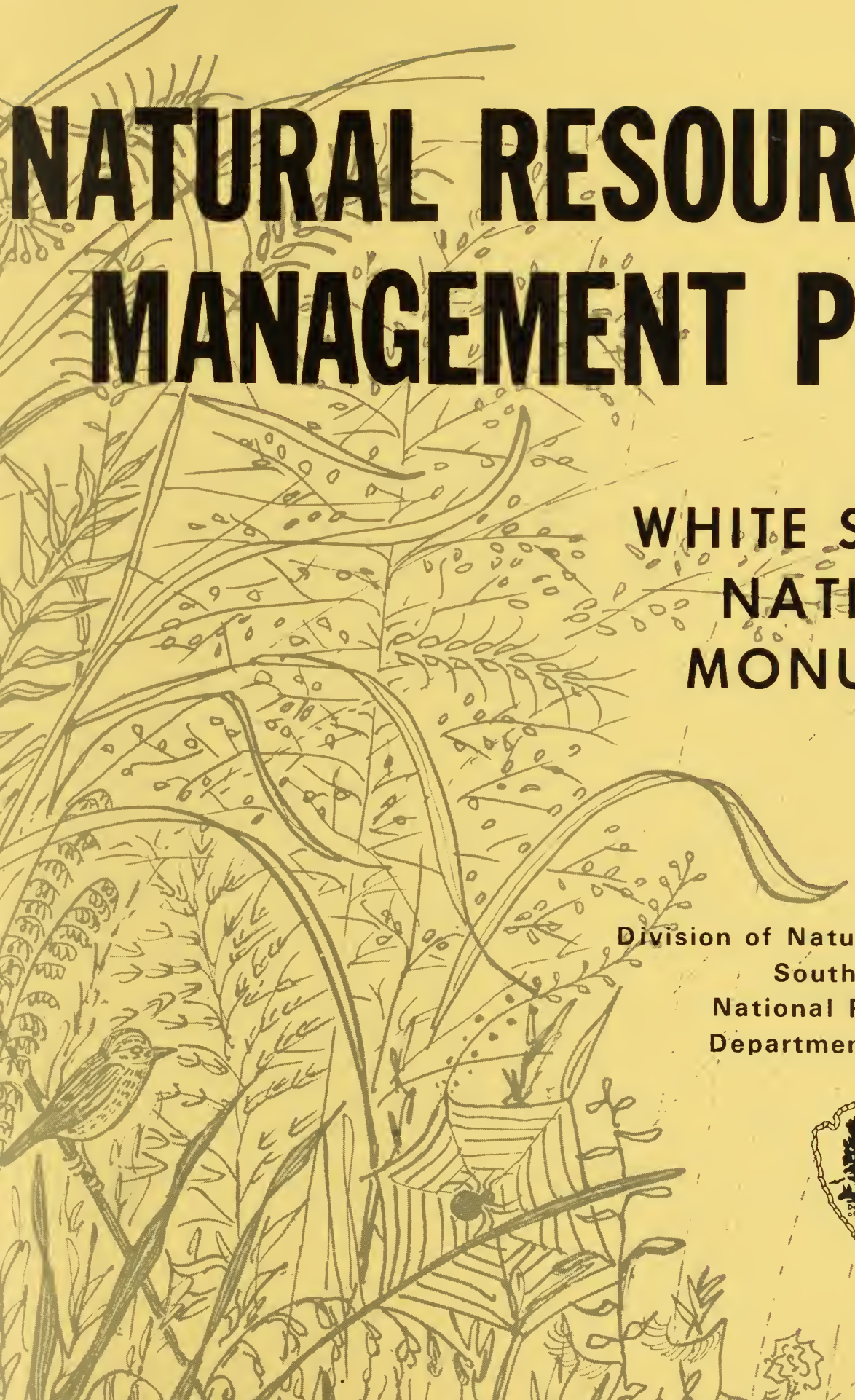
NATURAL RESOURCES MANAGEMENT PLAN

WHITE SANDS NATIONAL MONUMENT



Division of Natural Sciences
Southwest Region
National Park Service
Department of Interior

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NATURAL RESOURCES MANAGEMENT PLAN

FOR

WHITE SANDS NATIONAL MONUMENT

October
1974

Prepared by: White Sands National Monument Staff and Southwest Region Office of Natural Science

Reviewed by: Southwest Region Offices of History, Archeology, Planning, Maintenance, Interpretation, and Resources Management

Approved for Implementation by: _____
Regional Director, Southwest Region

FIG. 1. BARCHAN DUNE. NPS Photo. (Mang).

NATURAL RESOURCES MANAGEMENT PLAN

A Natural Resources Management Plan is a strategic planning document and a key factor in good management and preservation of the monument's resource.

This plan is a set of project statements which include proposed actions for implementation as well as 5-year programming sheets for maintenance and research actions. Other sections of the plan serve as an introduction and a set of parameters. Project statements are determined on the basis of approved Management Objectives and Land Classification. Management Constraints and Completed Research serve as guidelines for projects. The Plan serves the Superintendent in two ways: 1) as a manual for maintenance activities that will preserve the environment or achieve an environmental status quo to comply with Park Service Standards, and 2) a set of research projects and priorities that are designed to obtain additional information for management and interpretation.

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I. MANAGEMENT OBJECTIVES

STATEMENT FOR MANAGEMENT AND PLANNING

Purpose of the Park

White Sands National Monument is an ecological island of gypsum sand lying in the almost flat Tularosa Basin between the rugged parallel ranges of the San Andres and Sacramento Mountains in south-central New Mexico. It was established by Presidential Proclamation in 1933 under the provisions of the Antiquities Act of 1906, in order to preserve the unique geology of the gypsum sand dunes and to protect all of its other scenic, scientific and educational values.

Management Category

Natural Area

Management Objectives

General

Eliminate all roads not essential for the proper public use and management of the monument, when no longer essential for missile recovery.

Restrict use of motorcycles and four-wheel-drive vehicles to established roads.

Continue to look to the local business community adjacent to the monument for motel accommodations and major food services.

Expand opportunities for school children to use the monument as an environmental study area.

Continue to assist the military under the terms of the cooperative use agreement in missile recovery, minimizing the ecological impact of this activity.

Stress the three major themes of the area -- geology, biology, and esthetics -- with history, archeology, and recreation as secondary.

Strengthen the interpretive program by upgrading and expanding visitor facilities at the monument entrance, interpretive trails and exhibits to better communicate the value of White Sands.

Complete land transactions through acquiring private and State inholdings; exchange, transfer, or sell Dog Canyon property. Exchange National Park Service lands with the Bureau of Land Management to improve management of the Garton Lake area.

Rehabilitate headquarters by providing adequate office facilities, restrooms, housing, and landscaping.

Retain present form of concession operation and contract; consider some expansion of operation to meet visitor needs and provide adequate storage facilities for the concession.

Continue to provide for backcountry camping within the monument. Look to other public agencies and the private sector to continue to provide automobile and trailer camping in the general vicinity of the monument.

Visitor Use

Study means by which additional numbers of people can experience the monument without detriment to the resource.

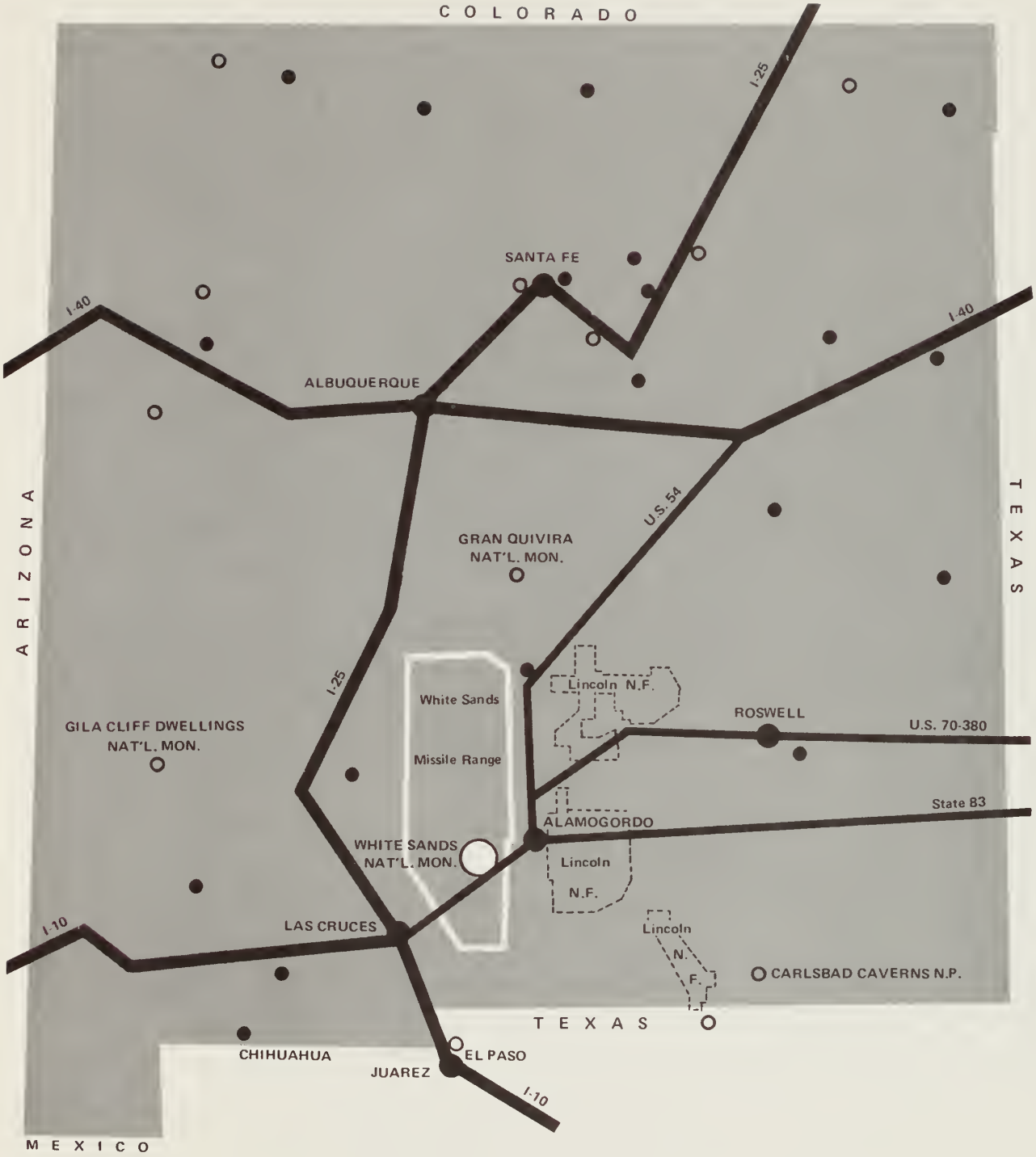
Continue to provide for recreational use, such as sand surfing and playing on the dunes, within designated areas.

Continue to provide picnic facilities in the Heart of the Dunes area.

Continue to provide automobile caravan tours to Lake Lucero.

Resource Management

Continue ongoing research studies to develop a resource management plan for the monument and to strengthen the interpretive program.



THE REGION

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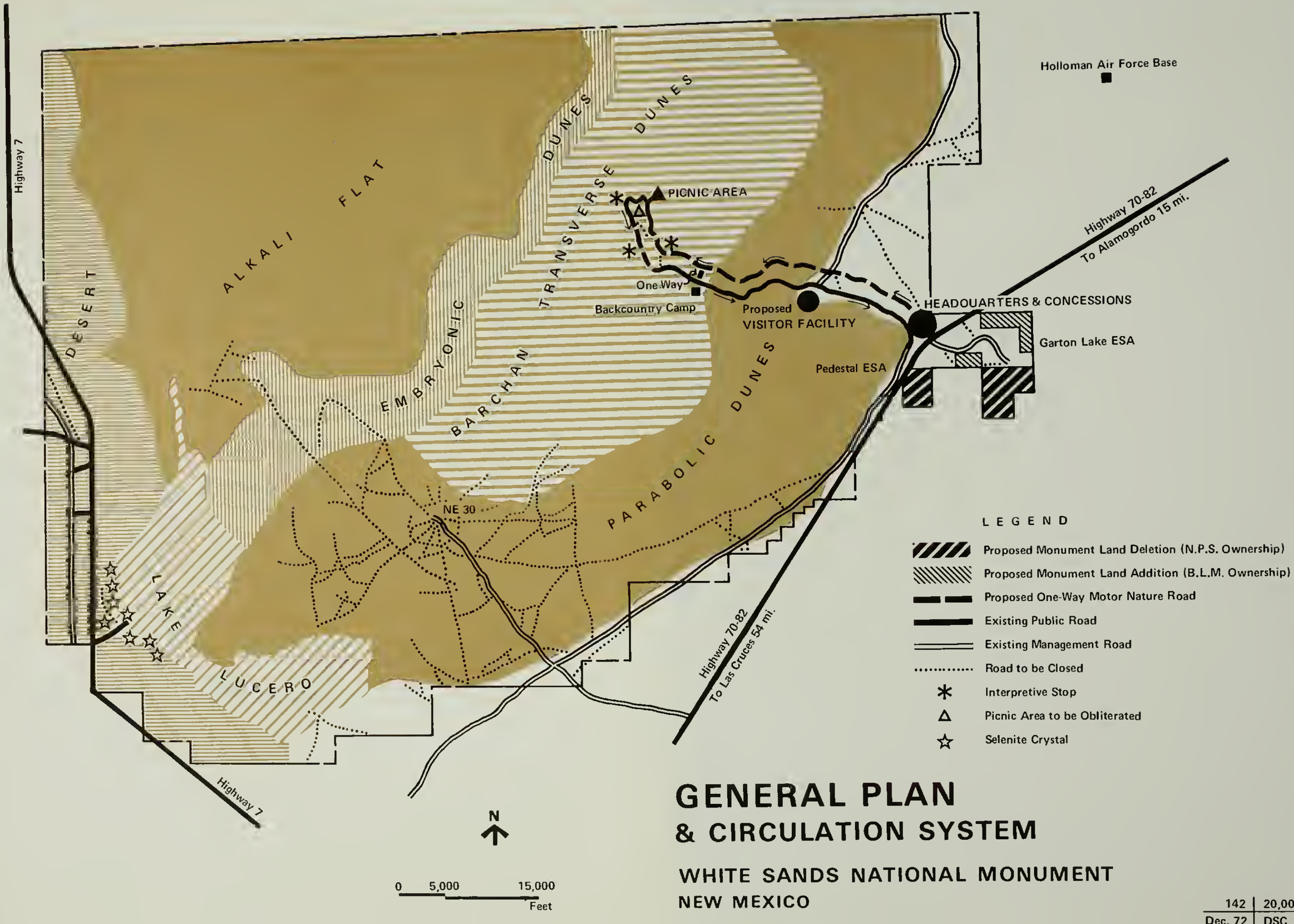


LEGEND

- Proposed Monument Land Deletion (N.P.S. Ownership)
- Proposed Monument Land Addition (B.L.M. Ownership)
- Proposed One-Way Motor Nature Road
- Existing Public Road
- Existing Management Road
- Road to be Closed
- Interpretive Stop
- Picnic Area to be Obliterated
- Selenite Crystal

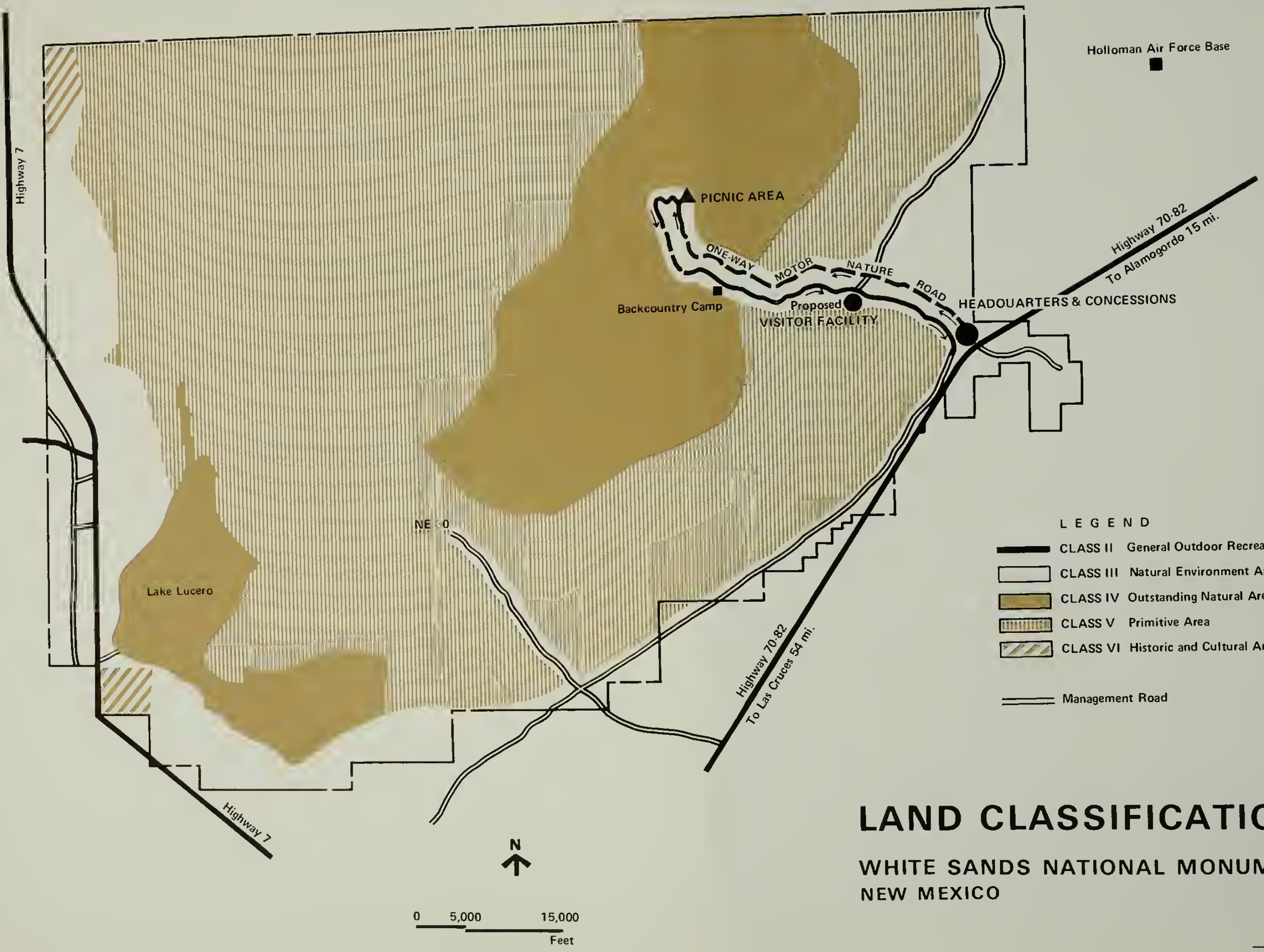
GENERAL PLAN
& CIRCULATION SYSTEM

WHITE SANDS NATIONAL MONUMENT
NEW MEXICO

142	20,005
Dec. 72	DSC

II. LAND CLASSIFICATION

The land classification plan for White Sands is based, first, upon establishing as Class IV those lands containing the outstanding natural features for which the monument was principally set aside. Two such areas are indicated on the map: the outstanding Selinite Crystal Beds in the Lake Lucero area, and the spectacular barchan and transverse dunes. A Class II designation is indicated for the proposed one-way motor nature road that is to lead into the heart of the dunes area, as well as for the picnic and recreation site off the main loop system, the existing headquarters site, and management roads. Class III lands are shown along the periphery of the sand dunes, on the west boundary, the east boundary, the south boundary, and in the Garton Lake area. Class VI lands are indicated in the two Mogollon and Apache remnant sites along the western boundary. The remainder of the monument, which includes the vast alkali flat area, the superb embryonic dunes, and the parabolic dunes, is classified as Class V.



LAND CLASSIFICATION

WHITE SANDS NATIONAL MONUMENT
NEW MEXICO

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III. ANNOTATED MANAGEMENT CONSTRAINTS

1. Cooperative Use Agreement, White Sands Missile Range.

   This has presently expired but is being continued (extended) for additional periods until a new agreement is completed. The agreement restrains the NPS from development and use by visitors in that part of the monument termed the Zone of Cooperative Use. The phrasing of the proposed new agreement will reflect any constraints that will bear upon management, subject to approval.

2. Public Land Order 703, Federal Register Document 51-3314, filed 3/8/51, published 3/14/51. Withdrew for military purposes the lands now included in the missile range, which includes all lands embraced within the boundary of the White Sands National Monument.

IV. NATURAL RESOURCE MANAGEMENT PROGRAM

Actions included in the project discussions will be divided into four types and designated in each action statement. The four types of actions are:

I. Those Actions Whose Implementation Will Have A Significant and Measurable Effect on the Environment

II. Those Actions Which Will Continue Existing Maintenance

III. Those Actions Which Will Initiate New Maintenance

IV. Those Actions Which Entail Research

NATURAL RESOURCE MANAGEMENT PROGRAM

Natural Science RSP-WRP Research Program - 1974

Number	Project Title	Status
RSP		
N-1	Origin and Development of Gypsum Dunes	Completed
N-2a	Ecosystem of the White Sands	Approved only, no action
N-3a	Plant Nutrition in a Gypsum Desert	Approved only, no action
N-4a	Ecology of Vertebrates of White Sands	Approved only, no action
N-5	Determination of Sand Dunes by Core Drilling	In progress since 4/73
WRP		
None		

RSP=Resource Studies Proposal

WRP=Water Resource Proposal

1. Project: Natural Resources Basic Inventory

An inventory of the natural resources is fundamental to planning for wise resource management and to comply with Natural Science Studies Activity Standards of the Service. While much information has been assembled in this area (plant and vertebrate inventories are available), the inventory is not yet complete.

Action (Research)

Initiate research projects to complete the monument's natural resources inventory, and prepare an ecosystem map. Begin map with data presently available and add natural resources data as it becomes available.

Research

Several studies are necessary to provide the monument with a basic natural resources inventory. They are:

A. A species list of all known fungi and bacteria in the monument area.

B. A species list of all invertebrates that are considered rare and/or endangered or of high visitor or scientific interest.

C. An inventory of all significant geologic features and processes; e.g., caves, geysers, mountains, rock systems, dune systems, etc.

D. An inventory and distribution map of major soils found within the monument.

E. An inventory of all streams, rivers, lakes, ponds, groundwater, and other water resources of the area.

Alternative

Contract studies on an emergency basis as required by immediate necessities as construction or environmental disasters occur.

FIG. 2. BLEACHED EARLESS LIZARD ENDEMIC TO DUNES. WHSA Photo.

2. Project: Vegetative Cover and Effects of Grazing

Little is known about the monument's vegetation dynamics and the effects feral animals have on the vegetative cover. Evidence suggests that cattle grazing is detrimental to the natural environment. A parcel of National Park Service Garton Lake property is under a Memorandum of Agreement with the Bureau of Land Management. This parcel is outside of the fenced area, and BLM controls the grazing rights. A parcel of BLM land is inside of the fenced area along the highway right-of-way. The Park Service controls the grazing on this land.

Action (New Maintenance and Research)

Encourage an early exchange of land parcels to provide a better boundary (squaring the shape), and make possible the elimination of grazing within the monument. Initiate research to study the vegetation dynamics, establish benchmarks, and initiate restoration action if research so advises.

Research

This study should determine the appropriate vegetation productivity, stand composition, succession, biomass, water and nutrient needs, and other ecological parameters; establish benchmarks for a monitoring system that would provide a warning system of future vegetative changes, and analyze the vegetative changes that occur when cattle are eliminated from the scene.

Alternative

Eliminate stock only and hope that natural recovery of vegetation will occur without research.

FIG. 3. MESQUITE-CREOSOTE BUSH DESERT AT BASE OF SAN ANDRES MOUNTAINS WHERE ORYX GRAZE. NPS Photo.

3. Project: Water Resources Analysis

A thorough analysis of the water resources of the monument is necessary for sound management and to comply with requirements of a Basic Ecosystem Survey, NEPA-1969 and Water Quality Acts. Activities on the adjacent White Sands Missile Range and Holloman Air Force Base may cause pollution of the water within the monument.

Both military installations are involved in research programs which generate various amounts of debris from missiles, drone aircraft, spent boosters, and warheads. Some of these items contain radioactive substances. Most warheads are recovered within hours after their impact by military recovery crews; however, much metallic debris remains. Though precipitation in the area is low, moist gypsum sand is highly corrosive, and iron alloy metals are rapidly etched. Components thus released are entering the groundwater system with unknown effects on the environment.

Action (Continue Maintenance and Research)

Continue to work with the military to divert planes and missiles onto other sections of the range, and speed recovery of new debris and recovery of older materials. Also, initiate research.

Research

A water resource study should analyze at least three basic factors: 1) the major sources and potability of fresh water, 2) the functions of fresh water in the ecosystem such as runoff amount, use by and importance to basic faunal system, etc., and 3) the threats from potential water deficiencies, pollution of water, etc.

The study should also include the identification of materials released into the environment from various types of debris, the effects of the material on plant and animal life, potential dangers from residual build-ups, and a groundwater circulation map of the area. This study should tie in with Projects 1E and 14.

Alternatives

FIG. 4. RECOVERY OF MISSILE DEBRIS BY MILITARY CREW. WHSA Photo.

4. Project: Basic Climatological Data

Basic natural resources data are needed for sound management planning, and are prerequisite to several long-range projects.

Action (Continue Maintenance)

Continue data gathering of climatological factors within the monument, and obtain more specific data from adjacent U. S. Air Force stations.

Research

None required.

Alternative

Continue minor climatological data gathering only and wait for the time that additional data is needed before initiating action to obtain additional information.

5. Project: Faunal Factors

Considerable data must be obtained if the monument's wildlife is to be managed most effectively to conform with Service mandates and comply with NPS Activity Standards.

Action (Continue Maintenance and Research)

Continue to document out-of-ordinary faunal sightings, continue cooperative activities with State and Federal wildlife management agencies, and initiate research. Of special importance is the occurrence of an introduced African antelope, Gemsbok (Oryx gazella) onto the adjacent missile range. Considerable cooperation is required with neighboring agencies to eliminate such exotic animals from becoming a serious problem. Also, careful restrictions on small mammal trapping is necessary, particularly in the case of light-colored forms of the Apache Pocket Mouse.

Research

A faunal study should include data gathering and analysis of distribution and abundance of animal species, population dynamics, migration, and immigration, and should be programmed in conjunction with portions of Project # 2.

Alternatives

A. Continue documentation of special faunal sightings only.

B. Strengthen cooperative activities with State and Federal agencies, encouraging those agencies to supply the Park Service with suitable information as requested.

FIG. 5. ORYX GAZELLA, AN EXOTIC ANIMAL FOUND AT WHITE SANDS.
Photo by New Mexico Department of Game and Fish.

6. Project: Kit Fox Ecology

The Mexican Kit Fox (Vulpes macrotis neomexicanus) is present in the monument in undetermined numbers. The ranges of all races of the Kit Fox have been seriously depleted in recent years; e.g., the San Joaquin Kit Fox was recently placed on the list of endangered species. Very little is known about this mammal within the monument, though there is good evidence that it is on the decline throughout its range.

Action (Research)

Initiate research and continue to provide protection to the species within the monument and adjacent lands through interpretive programs and word of mouth as opportunities arise.

Research

The study should determine the status of the species within the monument and in adjacent areas, establish population and range estimates, chart population trends, and determine a program to best assure the animal survival.

Alternatives

7. Project: Hazardous Animals

White Sands National Monument provides habitats for three species of rattlesnakes. These animals are largely nocturnal and not often seen by park visitors. They occasionally do wander into visitor use areas, however, and they must then be removed for the protection of the visitor and snake.

Action (Continue Maintenance)

Continue to trap and remove problem animals to more remote locations.

Research

None required.

Alternatives

A. Provide an escort for portions of the monument where the snakes are likely to be found.

B. Eliminate out of car activities to reduce possible contact with poisonous snakes.

C. Close the monument during periods when snakes are most likely to be encountered.

8. Project: Control of Exotic Plants

Salt Cedar (Tamarisk sp.) is an exotic plant introduced into the Southwest between 1899 and 1915. The plant has since spread throughout the region, and now occupies wet areas at White Sands National Monument. Small islands of Salt Cedars (200 acres in total) occur at several locations. Intentional plantings at Garton Lake, prior to Park Service administration of that area, have developed into dense thickets that inhibit native vegetation. Salt Cedars have also appeared along dune fringes and on disturbed soils near buildings, and along roadways.

Action (Continue Maintenance)

Continued action is necessary to control this fast-spreading exotic. Individual plants will be physically removed whenever possible, and small stands will be controlled whenever possible. The park staff will continue to investigate the literature for an effective control method that can be utilized in areas where the plants are more extensive.

Research

None required. Considerable research has already been done on the spread and dynamics of this very hardy and pervasive exotic.

Alternative

Conduct research to determine the extent of its damage to the area ecosystem.

FIG. 6. *TAMARIX SP.*, A WELL-ESTABLISHED EXOTIC PLANT. NPS Photo.

9. Project: Buckmoth Management

The monument contains scattered native cottonwood trees, mostly in the eastern third of the area. A defoliating insect, the Nevada Buckmoth, is active in spring and summer on and near these trees, and some years the foliage is severely reduced.

Action (New Maintenance)

Request assistance from the Regional Office of the Chief Scientist to investigate this problem. Considerable research has already been done by the U. S. Forest Service and other agencies. That data can be obtained and recommendations will be made on this problem by the Regional Office.

Research

None required.

Alternatives

A. Do nothing, and assume that the insects will not destroy the trees.

B. Initiate a research project to duplicate what has already been done.

FIG. 7. DEFOLIATED COTTONWOOD WITH EXPOSED ROOT SYSTEM. WHSA Photo.

10. Project: Protection of Cacti

Tourists passing through the Southwest do so at high rates of speed that prevent them from seeing the rich variety of cacti growing along the highways. Monument visitors drive at slower speeds through the area and notice plant life near the roadways, especially blooming cacti. There is increasing paucity of cacti immediately adjacent to the roads in the desert flats.

Action (Continue Maintenance and New Maintenance)

Increase law enforcement patrols along monument roads during the summer season. Post regulations on collecting of natural objects in conspicuous places, and publish information on enforcement actions taken. Establish transects at pertinent localities to determine present species of cacti and a control plot in an out-of-the-way area. Monitor these transects for at least five years.

Research

None required, other than the transects to be established by the monument staff. Some assistance from the Regional Office of the Chief Scientist may be required.

Alternatives

A. No action will mean the continued loss of plants.

B. Close desert flat roads during parts of the year when cacti are most obvious.

11. Project: Dune Impaction by Road Maintenance

Wind-blown sand creates a continuing road-maintenance problem. Removal of sand by heavy equipment is required, and this activity may not only cause impaction of the local environment but also disturb the natural hydrological system.

Action (Continue Maintenance and Research)

Initiate research and continue to maintain the roadway into the dunes to allow visitors access into the heartland of the monument. Through the maintenance foreman, continue to train equipment operators to be discreet in shifting sand deposits. Instill in the operators a feeling for the natural beauty of the dunes and a personal desire to preserve the area.

Research

A preliminary study should be undertaken to determine the extent of the impaction by vehicles on the environment along the maintained roadway. This study can be done through the efforts of the monument staff with support from the Regional Office of the Chief Scientist. If initial analysis, through the use of three transects that intersect the roadway and extend into the non-impacted dunes, indicates that the hydrological system is blocked or other significant results, additional research will then be required.

Alternatives

A. No action will continue the impactions and may endanger their sources.

B. Close the roadway and install a tramway type access into the sanddune area.

12. Project: Backcountry Impactions

Visitor access to the backcountry of White Sands National Monument is readily available from a wide variety of uncontrolled entry points. There are numerous roadways, particularly along the southwestern section of the monument, some of which were made by early ranchers and some resulting from early missile recovery activities. These roads are a scar on the land and encourage inappropriate backcountry travel. On-duty and off-duty military personnel are particularly able to enter the monument. This unauthorized trespass is causing damage to the natural resources; e.g., considerable damage occurs from the removal of selenite crystals. The area's terrain is especially attractive to cross-country travel, and the many roads along the monument boundary offer easy access to the wilderness portions of the area.

Action (Continue Maintenance and New Maintenance)

Continue to enforce present regulations that restrict off-road vehicular use. Continue to issue citations to offenders. Continue to explain impaction problems to area visitors and neighbors in adjacent communities through interpretive programs and public relations.

New maintenance will include a program to identify roads that are not used and which do not serve a necessary purpose. Work out an agreement with the White Sands Missile Range to refrain from using certain roads, and close those roads that have no purposes. Bar visitors from the roadways through the use of barricades and signing. Obliterate and reseed scars where possible. On the north boundary, post and sign at appropriate entry points. Fence nine miles of the boundary not in the dune area.

Research

None required.

Alternatives

A. No action will only allow the impaction to continue and the resources to be diminished.

B. Close all roadways but the major visitor route. This is impractical due to the sporadic use of portions of the monument for the retrievable of missiles.

C. Attempt to protect the backcountry solely through the increase of patrols and monument personnel.

FIG. 8. RARE LARGE SELENITE CRYSTALS IN BACKCOUNTRY. NPS Photo.

13. Project: Visitor Carrying Capacity Analysis

Pressures for additional day-use facilities and camping facilities within the monument are increasing. The existing picnic sites in the dunes area are inadequate to meet demands at certain times. Picnicking on the dunes and elsewhere causes additional cleanup measures, causes picnickers and other visitors to intermingle, and aesthetically diminishes the appearance of the resources. The increasing number of requests for backcountry camping, as well as for overnight sites for trailers and campers, suggests that pressures for development within the monument will increase.

Action (Continue Maintenance and Research)

Continue to operate under the day-use concept. No overnight stays will be permitted except for visitors who wish to hike to the backcountry campsite. Current regulations for primitive camping regulations will continue. Research will also be initiated.

Research

This study should investigate the impactions imposed upon the environment through use of the area by picnickers and campers. It will examine the types of uses that visitors impose upon the monument, and attempt to quantify the limits that the area can sustain and still retain the characteristics for which the monument was set aside to preserve and interpret. This study will include recommendations and discussion on the pros and cons of actions suggested.

Alternatives

A. Remove all picnicking and camping sites and expect visitors to use facilities outside of the monument.

B. Increase picnicking sites by allowing additional use of the roadsides and enlarging the present site.

C. Establish a major camping area for trailers and campers within the monument.

FIG. 9. AREA DESIGNATED AS BACKCOUNTRY CAMPSITE. WHSA Photo.

14. Project: Aquatic Pollution from Outside Sources

Several gullies feed runoff water from the Sacramento Mountain slopes into a pond on Holloman Air Force Base where a wide range of pollutants are introduced. Materials include, but are not limited to, rocket engine fuels, grease, oil sludge, concrete and metal debris. An intermittent stream -- Lost River -- carries the water from the pond toward the Alkali Flats and Lake Lucero, flowing along the northern boundary of the monument for a short distance.

In addition, a Holloman sewage lagoon is located near Garton Lake, and has backed up to within a few yards of overflowing into the lake. The lagoon water has a heavy load of nitrates and phosphates and would damage the lake aquatic system if it overflowed into that body of water. Also, Garton Lake is used as a National Environmental Study Area.

Action (New Maintenance and Research)

The monument staff will initiate discussions with neighboring rancher, C. B. Oliver, and Holloman Air Force Base to devise a method of controlling lagoon overflow, and with the Air Force regarding the pollution of Lost River and Lake Lucero. Research will also be initiated.

Research

Investigations will be initiated by the Regional Office of the Chief Scientist to quantify the potential pollution of the monument's aquatic regime. This initial analysis will determine the need for further research and actions.

Alternatives

A. Construct a low, dirt embankment along the monument's boundary to prevent water from entering Garton Lake.

B. Close the area to visitors until such time as it is determined that it poses no health hazards.

FIG. 10. GARTON LAKE NATIONAL ENVIRONMENTAL STUDY AREA. WHSA Photo.

15. Project: Noise Pollution

The silence to be found in the White Sands dunes is one of the important resources of the monument. The special quality of this silence is peculiar to the monument; a result of the sound absorbing quality of the gypsum dunes. Noise from military aircraft and missile activity shatters this quietude which is so rarely found in today's world.

Action: (New Maintenance)

Seek cooperation from the nearby, very active Air Force/Army Jet Fighter Base and the missile base. Seek to minimize sounds from supersonic flight testing through further agreements.

Research

None required.

Alternative

Interpret the situation to visitors. Wait for return of quiet when military activities cease, if ever.

HISTORICAL RESOURCES

The Oliver Lee Ranch in the detached Dog Canyon section of White Sands National Monument was being considered for nomination to the National Register. In recent years, however, alteration of the site's integrity has led to recommendations from both the National Park Service and the New Mexico State Cultural Properties Review Committee to reconsider the original recommendation. Instead of nomination to the National Register, the National Park Service advocates documentary preservation (in the Historic American Buildings Survey sense) of the site; an action which has been initiated.

ARCHEOLOGICAL RESOURCES

1. Project: Archeological Survey of White Sands National Monument

A comprehensive site survey has never been accomplished for the entire monument. More than 60 sites are known from an earlier, preliminary survey but the true extent and identification of all the archeological resources within the boundary are not known. An archeological base map for the entire monument does not exist. This information is necessary for management purposes, both in planning and in the protection of archeological resources.

Action (Research)

A comprehensive archeological survey, including testing, will be accomplished through contract to a qualified institution. In view of the large acreage involved, the survey will probably take several years.

Research

This research proposal will include provisions for an intensive survey and probable excavations of selected areas. A survey of historic sites has been accomplished. Objectives of the site survey will be:

A. A complete inventory of archeological sites as required by EO 11593.

B. An archeological base map

C. Obtain sufficient data to formulate research designs for further investigations.

D. Obtain data for use in interpretive program.

Alternatives

There is no feasible alternatives since this archeological survey is required by EO 11593.

V. PROGRAMMING SHEETS AND RESEARCH PRIORITIES

Includes

Maintenance

Research

MAINTENANCE

ACTIVITIES AND 5-YEAR PROGRAMMING SHEET

Pkg. No.	Area Priority	RMP Ref. No.	Project Title	Year 1 NPS M.Y.	Year 1 Cost/ $1000	Year 2 NPS M.Y.	Year 2 Cost/ $1000	Year 3 NPS M.Y.	Year 3 Cost/ $1000	Year 4 NPS M.Y.	Year 4 Cost/ $1000	Year 5 NPS M.Y.	Year 5 Cost/ $1000	Date Submitted 10-237 10-238
		N2	Vegetative Cover and Effects of Grazing	.01	.2	.01	.2							
		N3	Water Analysis	.02	.2	.02	.2	.02	.3	.02	.3	.02	.3	
		N4	Basic Climatological Data	.02	.2	.02	.2	.02	.2	.02	.2	.02	.2	
		N5	Faunal Factors	.01	.1	.01	.1	.01	.1	.01	.1	.01	.1	
		N7	Hazardous Animals	.01	.1	.01	.1	.01	.1	.01	.1	.01	.2	
		N8	Control of Exotic Plants	.01	.2	.01	.2	.01	.2	.01	.2	.01	.2	
		N9	Buckmoth Management	.01	.5	.01	.5	.01	.5	.01	.6	.01	.6	
		N10	Protection of Cacti	.01	.1	.01	.1	.01	.1	.01	.1	.01	.1	
		N11	Dune Impaction by Road Maintenance	.1	1	.1	1	.1	1	.1	1	.1	1.5	
		N12	Backcountry Impactions	.02	.2	.02	.2	.02	.2	.02	.2	.02	.3	
		N14	Aquatic Pollution	.02	.2	.02	.2	.02	.2	.02	.2	.02	.3	
		N15	Noise Pollution	.01	.1	.01	.1	.01	.1	.01	.1	.01	.1	

RESEARCH

ACTIVITIES AND 5-YEAR PROGRAMMING SHEET

Pkg. No.	Area Priority	RMP Ref. No.	Project Title	Year 1 NPS M.Y.	Year 1 Cost/ $1000	Year 2 NPS M.Y.	Year 2 Cost/ $1000	Year 3 NPS M.Y.	Year 3 Cost/ $1000	Year 4 NPS M.Y.	Year 4 Cost/ $1000	Year 5 NPS M.Y.	Year 5 Cost/ $1000	Date Submitted 10-237 10-238
	1	N1E	Inventory of Water Resources		5									
	2	N1D	Inventory of Soils				10							
	3	N3	Water Resources Analysis						7.5					
	4	N14	Aquatic Pollution						2.5					
	5	N11	Dune Impaction by Road Maintenance								3			
	6	N5	Faunal Factors								3		1	
	7	N2	Vegetative Cover and Effects of Grazing								6		3	
	8	N13	Visitor Carrying Capacities										4.5	
	9	N10	Protection of Cacti											
	10	N6	Kit Fox Ecology											
	11	N1C	Inven. of Sign. Geol. Features											
	12	N1B	Inven. of Invertebrates											
	13	N1A	List of Known Fungi and Bacteria											

TITLE 43—PUBLIC LANDS: INTERIOR

Chapter I—Bureau of Land Management, Department of the Interior

Appendix—Public Land Orders

[Public Land Order 703]

NEW MEXICO

WITHDRAWING PUBLIC LANDS FROM PROSPECTING, LOCATION, ENTRY, AND PURCHASE UNDER THE MINING LAWS AND RESERVING THEM FOR THE USE OF THE DEPARTMENT OF THE ARMY FOR MILITARY PURPOSES

By virtue of the authority vested in the President and pursuant to Executive Order No. 9337 of April 24, 1943, it is ordered as follows:

Subject to valid existing rights, the public lands within the following-described areas in New Mexico are hereby withdrawn from prospecting, location, entry, and purchase under the mining laws of the United States and reserved for the use of the Department of the Army for military purposes:

NEW MEXICO PRINCIPAL MERIDIAN

Tps. 6 to 16 S., R. 2 E.,
Secs. 1 to 4, 9 to 16, 21 to 28, and 33 to 36 inclusive in each township.
T. 17 S., R. 2 E.,
Secs. 1 to 4, 9 to 16, 22 to 27, and 34 to 36 inclusive.
T. 18 S., R. 2 E.,
Secs. 1, 2, 11 to 14, 24, 25, and 36.
Tps. 11 to 18 S., inclusive R. 3 E.
T. 19 S., R. 3 E.,
Secs. 1 to 18, 20 to 29, and 32 to 36 inclusive.
T. 20 S., R. 3 E.,
Secs. 1 to 4, 9 to 16, 22 to 27 inclusive, 35 and 36.
T. 21 S., R. 3 E.,
Secs. 1, 2, 11, 12, 13, 24, and 25.
Tps. 17 to 23 S., inclusive R. 4 E.
Tps. 17 to 25 S., inclusive Rs. 5 and 6 E.
Tps. 17 to 23 S., R. 7 E.
Tps. 24 and 25 S., R. 7 E., those portions west of the Southern Pacific Railroad right-of-way.

APPENDIX B - COMPLETED RESEARCH

Completed Research (annotated list of past projects/bibliography)

Date	Item	Result
1962	Confirmation of Source Locale of Gypsum Sands at White Sands	Report by Paul V. Wykert Regional Chief, Boundary Studies Branch. Report of findings filed in N22 file - WHSA
1962-1966	Dune Movement and Structures of Dunes	Dr. Edwin D. McKee, USGS, Geological paper entitled Structures of Dunes at White Sands National Monument New Mexico. Copy of article in library WHSA.
1965	Analyses of Mineral Content of Ground Water Samples Taken on the Loop Drive and at Lake Lucero	Dr. Roger Anderson, UNM Department of Geology, Albuquerque. Report of findings in file N22 WHSA.
1965	Core Samples (149' Core) Taken at Lake Lucero	Dr. Roger Anderson, UNM Department of Geology, Albuquerque. Report on findings in file N22 WHSA.
1966	Core Samples Taken at Lake Lucero and Near WSMR Route No. 6	Department of Army Contract w/Woodward, Clyde, Sherard & Associates, Oakland, Calif. Copy of boring logs in file N22 WHSA.
1971	Hydrologic Control Over the Origin of Gypsum at Lake Lucero	Master's Thesis by Roger Allmendinger, NMIMT, Socorro. Copy on file in WHSA library.
1971	Growth & Movement at White Sands New Mexico	Geological manuscript by Edwin McKee, USGS Denver. Copy in Denver - No copy at WHSA.
1971	Deformation of Lee-Side Laminae in Eolian Dunes	Geological manuscript by Edwin McKee, USGS Denver. Copy at Denver. No copy at WHSA
1973	The Herpetofauna of the Tularosa Basin	Summary of observation records over three year period by Bob McKeever.

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APPENDIX C - COLLECTIONS AND LOCATIONS

	COLLECTIONS	LOCATIONS
Cataloged:		
1-84	Bird Skins	Storage Interp. Spec. Office, WHSA
2-24	Mammal Skins	Storage Interp. Spec. Office, WHSA
3-29	Projectile Points	Transferred to S.W. Archeological Center
4-7	Miscellaneous Artifacts	Transferred to S.W. Archeological Center
5-22	Miscellaneous Artifacts	On Display in Various Visitor Center Exhibits
6-11	Bird Paintings	Storage Interp. Spec. Office, WHSA
7-50	Gypsum Specimens	Storage Interp. Spec. Office, WHSA
8-14	Potsherds	Storage Interp. Spec. Office, WHSA
9-15	Oil Painting	Storage Interp. Spec. Office, WHSA
10-3	Misc. Projectile Points	Storage Interp. Spec. Office, WHSA
11-200	Books and Pamphlets	Monument Library, WHSA
Uncataloged:		
1-30	Reptile Specimens	Storage Interp. Spec. Office, WHSA
2-300	Botanical Specimens	Herbarium, WHSA
3-300	Pamphlets, Booklets, Journals, etc.	Monument Library, WHSA
4-1800	Colour Slides, 35mm	Filed Interp. Spec. Office, WHSA
5-300	8 x 10 B&W Photos	Filed Interp. Spec. Office, WHSA
6-3000	B&W Negatives	Filed Interp. Spec. Office, WHSA
7-12	Small Boxes of Misc. Artifacts	Stored in Maintenance Chief Office, WHSA
8-20	20 Pounds of Trinitite	Stored in Interp. Spec. Office, WHSA

APPENDIX D

SPECIFIC MANAGEMENT PLANS

APPENDIX E

ANNUAL REVIEW, CHANGES AND DATES

VII. OVERVIEW

The following is a review of all actions proposed within the White Sands National Monument Natural Resources Management Plan, and outlined within the four categories described within the Management Program.

I. THOSE ACTIONS WHOSE IMPLEMENTATION WILL HAVE A SIGNIFICANT AND MEASURABLE EFFECT ON THE ENVIRONMENT.

No such actions are planned. Each project included in the Resource Management Program was considered on its own merit and, in every case, those actions planned do not have a significant and measurable effect on the environment. All of the actions fall into categories II, III, or IV.

II. THOSE ACTIONS WHICH WILL CONTINUE EXISTING MAINTENANCE.

1. Natural Science Project # 7 - HAZARDOUS ANIMALS: It is a standard practice of the National Park Service to capture and remove animals that may be hazardous to the public. Although animals such as rattlesnakes and skunks are primarily nocturnal, those animals which pose a potential danger to the public will be removed to more remote locations.

2. Natural Science Project # 8 - CONTROL OF EXOTIC PLANTS: Salt Cedar (Tamarisk sp.) is an exotic plant which is a visual intrusion and a threat to other phreatophytic vegetation. This exotic will be removed by hand whenever possible.

3. Natural Science Project # 10 - PROTECTION OF CACTI: Although it is illegal to remove cacti from the monument, there is a dearth of cacti near the roads of the monument. This suggests that visitors are collecting these plants. This project will intensify efforts to inform the visitor of existing regulations and establish transects to determine the extent of population changes of cacti.

4. Natural Science Project # 11 - DUNE IMPACTION BY ROAD MAINTENANCE: Aeolean sand deposits often block the roadway into the dunes area. This sand must be removed to allow visitor access but in such a way that the visual impact of the effects of heavy equipment are minimized.

5. Natural Science Project # 12 - BACKCOUNTRY IMPACTIONS: There is considerable unauthorized entry onto the monument and the resultant roads cause considerable damage to soils and vegetation. This project proposes the following: 1) Continue to enforce present regulations that restrict off-road travel, 2) Continue to work with the public to explain the impacts of off-road travel, 3) Identify roads that are not used or those

which serve no necessary purpose, 4) Initiate discussions with officials of the White Sands Missile Range to enlist their assistance in protecting the resource from unauthorized travel, and 5) Fence nine miles (14 km) of boundary.

6. Natural Science Project # 13 - VISITOR CARRYING CAPACITY ANALYSIS: The monument is presently operated on a day-use basis with the exception of those visitors who hike to the backcountry campsite. This project will continue the day-use concept but will attempt to analyze the human impacts on and establish a carrying capacity for the monument.

III. THOSE ACTIONS WHICH WILL INITIATE NEW MAINTENANCE.

1. Natural Science Project # 9 - BUCKMOTH MANAGEMENT: The Nevada Buckmoth (Hemileuca nevadensis Stretch) is a pest insect which feeds on cottonwood trees in the monument. A report with suggestions for management of this pest will be prepared by the Office of the Chief Scientist. It appears that this pest insect can be satisfactorily controlled by the use of the bacteria Bacillus thuringiensis Berliner.

2. Natural Science Project # 15 - NOISE POLLUTION FROM AIRCRAFT: The nearby air force base generates considerable noise which detracts from the quality of the visitor experience. This project will seek cooperation from the base to lessen this noise when possible.

IV. THOSE ACTIONS WHICH WILL ENTAIL RESEARCH:

1. Natural Science Project # 1 - NATURAL RESOURCES BASIC INVENTORY: This project calls for an inventory of natural resources not already inventoried and is thought to be necessary for wise planning in the monument. This project will inventory and list the hydrological features, major soils, significant geological features and processes, and plant and animal species.

2. Natural Science Project # 2 - VEGETATIVE COVER AND EFFECTS OF GRAZING: This project is both new maintenance and research since it calls for opening negotiations with the Bureau of Land Management to exchange a parcel of land and research on the vegetative components and dynamics of the monument.

3. Natural Science Project # 3 - WATER RESOURCES ANALYSIS: This project is both continuing maintenance and research. The continuing maintenance is involved with a continuing public relations project with the military to divert planes and missiles onto other sections of the missile range and speed recovery of debris which results from their actions. The research is to analyze the major sources and potability of fresh water, ascertain the function of fresh water in the local ecosystem, and

evaluate the threats of potential water deficiencies and pollution.

4. Natural Science Project # 4 - BASIC CLIMATOLOGICAL DATA: Basic climatological data are needed for formulation of sound management planning and decisions, to fulfill interpretive needs, and to comply with Natural Science Activity Standards.

5. Natural Science Project # 5 - FAUNAL FACTORS: A faunal study should include the following: data gathering, analysis of distribution and abundance of animal species, population dynamics, migration and immigration, and should be coordinated with faunal inventories included in Projects 1 and 6.

6. Natural Science Project # 6 - KIT FOX ECOLOGY: The Mexican kit fox (Vulpes macrotis neomexicanus) is present in the monument in undetermined numbers. This research will determine the status of the species within the monument, establish population and range estimates, chart population trends, and determine a program to best assure this animal's survival.

7. Natural Science Project # 14 - AQUATIC POLLUTION FROM OUTSIDE SOURCES: This project is essentially a public relations project which will enlist aid from both private and public sectors to prevent the introduction of pollutants onto the monument. The regional office of the Chief Scientist will further investigate the potential for pollution of Lost River, Garton Lake, and Lake Lucero.

DETERMINATION: It is determined that all actions above are maintenance and research in character and do not significantly effect the environment or cause controversy. Therefore, in accordance to the following paragraph of "Guidelines for the Preparation and Review of Environmental Assessments and Statements" (National Park Service, July 29, 1974, pg. 6),

> "Based on an overview of all actions affecting the environment, the Responsible Official may determine that many plans, projects, and operational decisions have negligible potential to cause controversial or significant environmental impact and therefore do not require preparation of environmental assessments."

No Environmental Assessment will be prepared.

Recommended by Edward H. Wagner 9/4/1974
Chief Scientist, Southwest Region

Concurred by: John W. Hennebergen 9-4-74
Associate Regional Director, Professional Services

Approved by: G R Thompson
Regional Director, Southwest Region